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Schizolinnaea van Emden, an Afrotropical genus of Tachinidae (Diptera) with sexually dimorphic antennae

by

Shirley Robertson and **David Barraclough**
(Natal Museum, P. B. 9070, Pietermaritzburg, South Africa)

ABSTRACT

A diagnosis is given for the monotypic genus *Schizolinnaea* van Emden, 1960. The male of *S. mirabilis* van Emden, 1960 is described and figured for the first time, based on specimens from the eastern highlands of Zimbabwe. The third antennal segment of the male is markedly bifid, unlike that of the female which is unmodified as in both sexes of most Tachinidae. Subdivision of the third antennal segment in Tachinidae is discussed. A tentative suggestion for the development of the bifid antenna in males of *S. mirabilis* is given.

INTRODUCTION

Bezzi (1923) stated that in the Cyclorrhapha, pectination or 'splitting' of the antennae is very rare. In the literature it is evident that in such cases the third antennal segment of male Tachinidae is multifurcate, bifid or trifid, or there are one or two subdivided branches off the main branch. Subdivision of the third antennal segment was observed by Bezzi in Tachinidae from all regions, except the Afrotropical Region. It was not referred to subsequently by Crosskey (1984) in his key to African genera. We have seen only two African species with such subdivided antennal segments in males, namely *Peribaea cervina* Mesnil, 1954 from Zaire and South Africa (Siphonini) and the East African species *Schizolinnaea mirabilis* van Emden, 1960 (Linnaemyini). The latter species was described from females only, although in the original description Van Emden stated that he remembered seeing what he believed to be the conspecific male in some other collection, and that the third antennal segment was deeply cleft in that specimen. This can now be confirmed, following the location of two males in the Natal Museum tachinid collection. Each have the third antennal segment strikingly bifid.

Modification of the third antennal segment occurs very rarely in males of some species of Tachinidae, but not necessarily in all species of a particular genus. Conspecific females, as a rule, have unmodified antennae. An exception is *Talarocera nigripennis* (Wiedemann 1830) from Brazil, in which the female has the third segment bifid, and the male with the same segment appearing to be elaborately multifurcate (see Bezzi (1923)). An interesting correlation (noted by Bezzi and occurring in both African species with modified antennae) is the development of a relatively broad frons in males. In *S. mirabilis* the eyes of the male are markedly dichoptic and the width of the frons is similar to that of females. A broad frons in both sexes occurs in other genera of Afrotropical Linnaemyini we have seen, namely *Linnaemya* Robineau Desvoidy and *Marshallomyia* van Emden.

Wood (1987) stated that hilltopping behaviour of male tachinids can be categorised as being of two types, with some species appearing to rely on sight to locate females, and others using antennae. It has been observed that males which use sight are often holoptic and their eyes are significantly larger than those of conspecific females. In species which rely on antennae there is often no significant difference in the size of the eyes and males are dichoptic, as occurs in *Schizolinnaea*. Consequently, the conspicuously larger and highly modified third antennal segment of male *Schizolinnaea* may have some sort of sensory mate-seeking function, although it could also be used in signalling or courtship displays to attract females.

MATERIALS AND METHODS

All specimens studied were dry-mounted on pins. Male genitalia were dissected and cleared in hot potassium hydroxide. Abbreviations used for institutions are:

BMNH – The Natural History Museum, London, UK;
ISNB – Institut Royal des Sciences Naturelles de Belgique, Belgium;
NMSA – Natal Museum, Pietermaritzburg, South Africa.

Bilaterally symmetrical structures are described in the singular. Holotype label data are quoted exactly; a slash denotes the end of a line of print and a semicolon separates data quoted on different labels. Label data are supplemented with co-ordinates given in square parentheses for all localities. Holotype measurements are given in parentheses following the range for other specimens examined. Wing length was measured from the humeral crossvein to the wing-tip.

TAXONOMY

Schizolinnaea van Emden, 1960

Schizolinnaea van Emden, 1960: 407. Type species *Schizolinnaea mirabilis* van Emden, 1960, by original designation.

Diagnosis (based on both sexes):

Head (Figs 1 & 2): Eye hairing very short and sparse, visible only with rotation. Ocellar setae proclinate. Facial ridge bare. Parafacial bare. Palpus very reduced, same length or slightly longer than length of second antennal segment. Proboscis with mentum 0,6–0,8 × head height. Male with one strong proclinate orbital seta and 2–3 proclinate setulae.

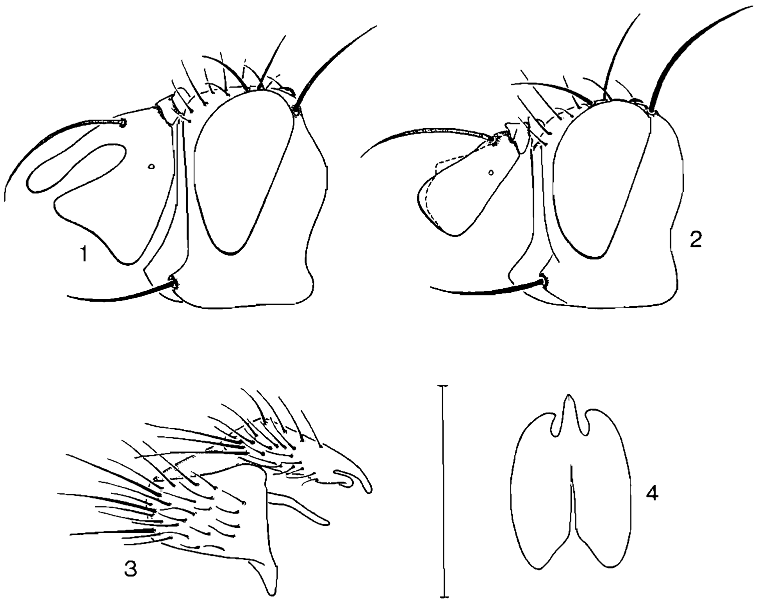
Thorax: Propleuron bare. Prosternum bare. 2 + 3 dc setae. 0 + 1 acr setae (prescutellar pair). Apical scutellar setae hair-like, crossed apically and inclined upwards. Mesonotum dark red-brown, contrasted with pale (ivory) on humeral callus, notopleuron, extreme sides of prescutum, supra-alar region, posteromedian prescutellar spot and on scutellar margin.

Wing: Cell R_5 narrowly open. Bend of M with very short appendix. R_{4+5} setulose to beyond r-m, setulae reaching 0,5 × distance to junction of m-cu with M. Appearance hyaline, with smoky-brown patterning on much of apical half, forming transverse band between r-m and m-cu from costal margin to just beyond cubital vein, and across wing-tip reaching posteriorly to bend of M.

Legs: Fore coxa bare on inner anterior surface.

Abdomen: Suture between T3 and T4 not visible. Postabdomen (Figs 3 & 4): Cerci fused anteromedially; aedeagus apparently of Verbeke's type II; pre- and postgonites well developed.

Discussion: An important point is that eye hairing in *Schizolinnaea* is very short and sparse, barely visible in silhouette or with rotation. This is contrary to van Emden (1960), who stated that females had moderately long hairing and that the male was expected to have quite conspicuous hairing. The fact that *Schizolinnaea* does have short eye hairing was noted by Crosskey (1984: 218).



Figs 1–4. *Schizolinnaea mirabilis* van Emden. 1–2. Head profile, showing vibrissa, setae on frons and vertex, and shape of antenna. 1. Male. 2. Female (slashed line shows variation in antennal shape). 3–4. Male terminalia. 3. Cercus, surstylus and epandrium, profile. 4. Cerci, dorsal view, showing fusion anteriorly (vestiture omitted). [Scale line = 0,5 mm, Figs 3–4.]

Schizolinnaea mirabilis van Emden, 1960

Figs 1–4

Schizolinnaea mirabilis van Emden, 1960: 408; Crosskey, 1980: 848, 1984: 257.

Van Emden (1960) described *S. mirabilis* based on females only. The following sections describe the male (only character states different from female) and female intraspecific variation.

Holotype ♀ (BMNH): 'Uganda: / Ruwenzori Range / xii.1934-i.1935. / B.M.E. Afr.Exp. / B.M.1935–203'; 'Namwamba Valley [00°13'N:30°00'E] / 6500 ft / F. W. Edwards'.

Male: Dimensions (in mm): Antenna 1,1; body 5,9–6,0; wing 4,1–4,2.

Antenna (Fig. 1): First antennal segment visible in profile; second segment 1,0–1,3 × length of first segment. Third antennal segment highly modified; bifurcate with arista on slender, finger-like dorsal fork; entire length 0,7 × that of head. Arista inserted about 0,3 × distance along length of dorsal fork. Dorsal fork of antenna about same length as arista; slightly broader apically. Ventral fork strikingly axe-shaped, apico-dorsal margin relatively sharply angled and bent slightly outwards in frontal view; apical width 4,0–5,0 × that of dorsal fork; excavate between upper and lower margins, mainly on outer surface. Sacculus organ with pit clearly visible at base of ventral fork.

Postabdomen (Figs 3 & 4): Sternite 5 with lobes almost entirely separate. Cercus bifid anteriorly in profile and dorsal view. Surstylus very reduced, forming needle-like protrusion in profile, with small setula dorso-basally. Epandrium with fairly strong setulae.

Female: Dimensions (in mm): Antenna 0,9–1,1 (1,1); Body 5,7–6,9 (6,9); wing 4,2–4,9 (4,9).

Antenna (Fig. 2): Third segment variable in shape; apex ranging from bluntly axe-shaped to more smoothly rounded with distinct dorso-apical notch. Sacculus organ with pit situated ventrally on basal half.

Other material examined: MALAŴI: 1 ♀ (paratype), Livingstonia [10°35'S: 34°10'E], 3.v.1940, R. C. Wood, 4400' (BMNH). ZIMBABWE: 2 ♂ 4 ♀, N. Vumba [19°10'S:32°50'E], 23.iv.1964–14.iii.1966, D. Cookson (NMSA).

Remarks: The female specimens from Vumba are much paler than the female holotype and paratype examined. The dark ground colouring of the thorax thus varies from reddish/yellow-brown to blackish-brown. The number of setulae along vein R_{4+5} beyond r-m ranges in females from two to seven, extending about half the distance to the junction of m-cu with M.

Schizolinnaea mirabilis is a central to East African species, recorded from Uganda, Tanzania and Malaŵi (Van Emden 1960) and Vumba, Zimbabwe (19°05'S:32°45'E), the latter locality appearing to represent the southernmost limit.

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